Aug. 22, 1972 K. D. HERMANN 3,686,055

HAND HELD LABELLING APPARATUS

Filed Feb. 27, 1970 3 Sheets-Sheet 1

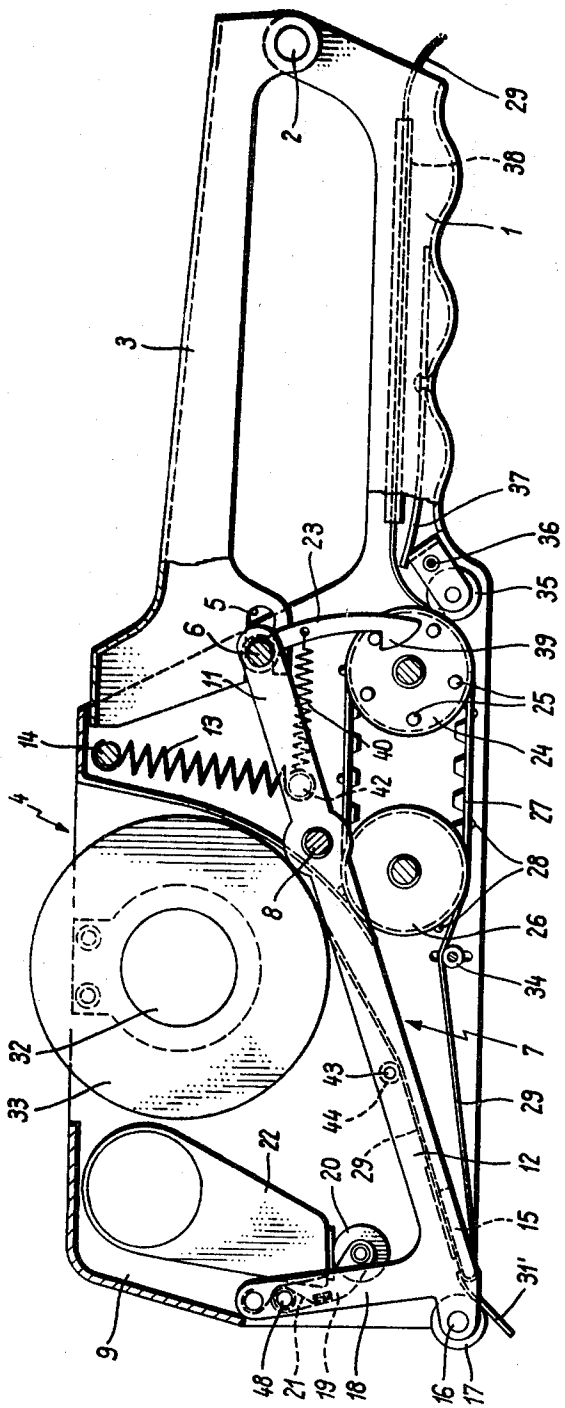


Fig. 1

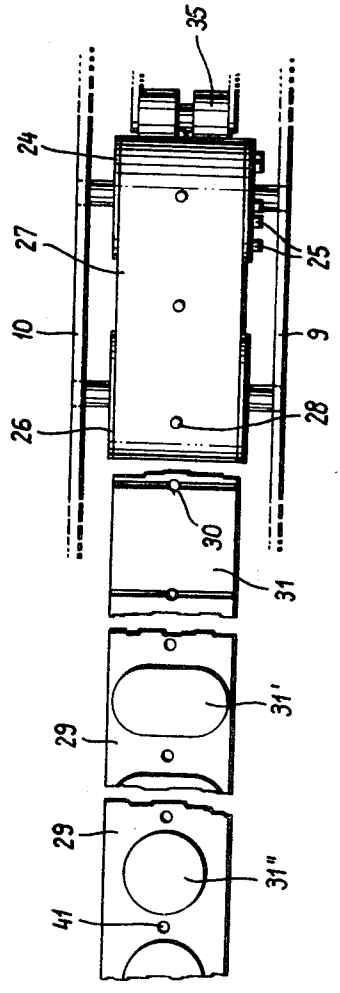


Fig. 2

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HAND HELD LABELLING APPARATUS

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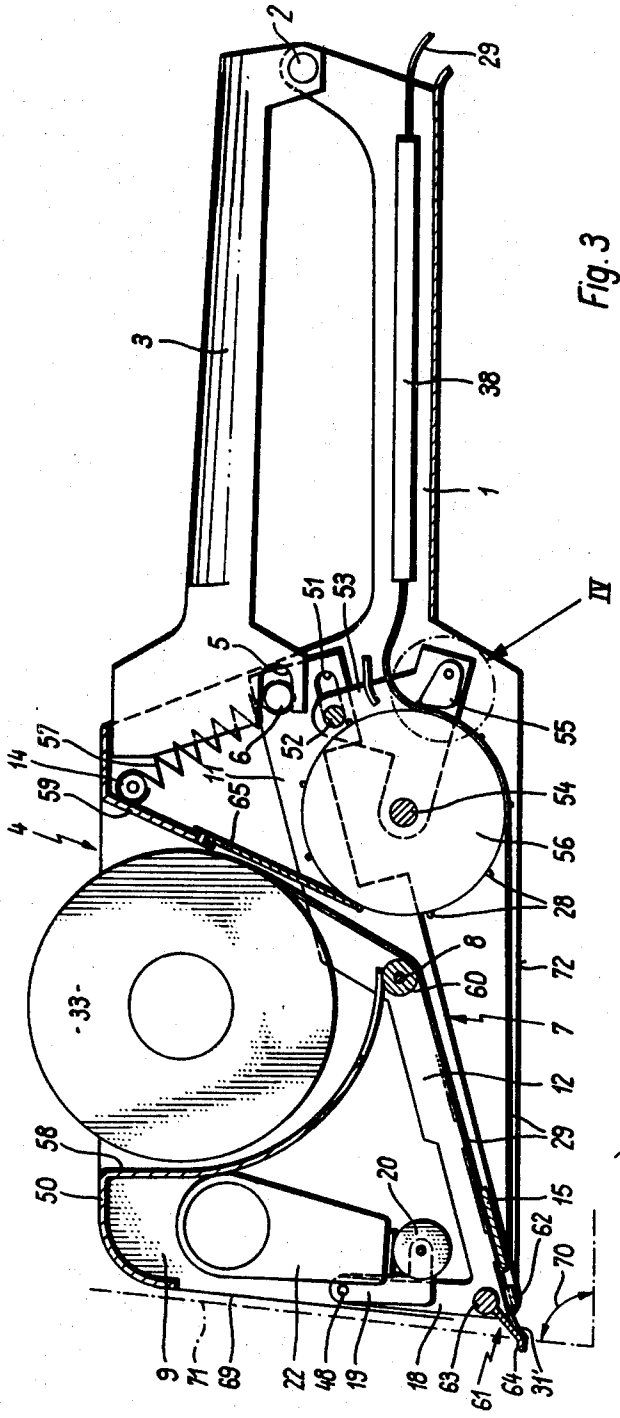


Fig. 3

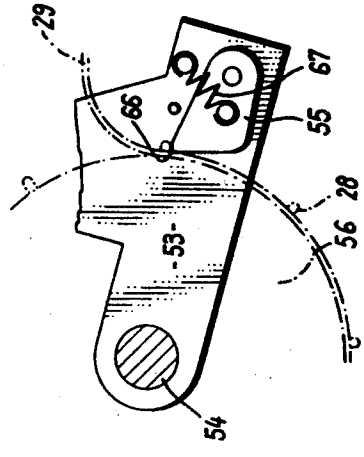


Fig. 4

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HAND HELD LABELLING APPARATUS

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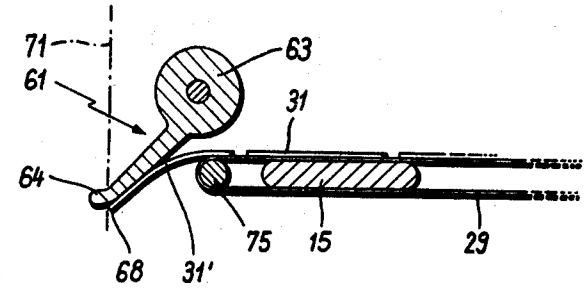


Fig. 5

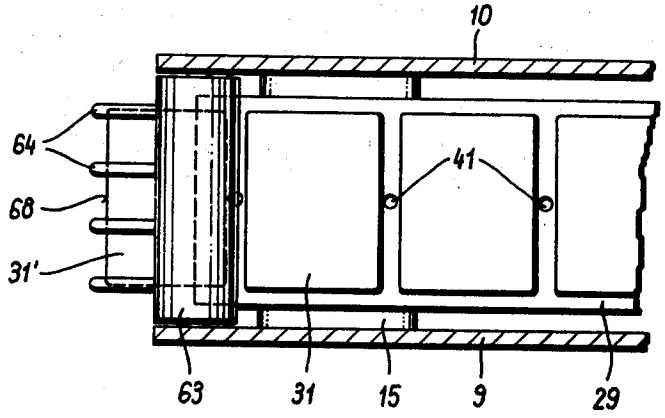


Fig. 6

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3,686,055

HAND HELD LABELLING APPARATUS

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Int. Cl. B65h 5/28
U.S. Cl. 156—384 17 Claims

ABSTRACT OF THE DISCLOSURE

A manually operated feed device for a label web or tape is located within the casing of a hand held labelling apparatus, the feed device being arranged to withdraw the label web or tape from a label reel inserted into the casing of the apparatus and to feed it to a label delivery station, the feed devices engaging the label web or tape along the centre line thereof which in turn is arranged to lie in the centre plane of the apparatus, permitting label webs or tapes of different widths to be used, and the region of the feeding device in which engagement with the label web or tape is effected being accessible from the outside of the casing to permit easy and accurate insertion of the label web or tape.

This invention relates to a hand held labelling apparatus having a feed device which engages a label web in the centre line thereof.

Whenever a manual lever or other release member, of such apparatus is actuated, the apparatus delivers at its delivery point a label, an adhesive label or the like, upon which previously also an imprint, in particular a price indication, may have been effected. However, for various reasons label reels having only one defined width can be used in the known hand held labelling apparatus.

In known hand held labelling appliances the feed device engages in incisions in the edges of a carrier web or tape, so that for this reason only label reels of a defined width can be used therein. The German Utility Model 1,997,251, admittedly discloses a manual labelling apparatus in which the feed device for the label tape may be formed by a wheel with radially projecting pins which engage in openings along the centre line of the tape. Nevertheless, this apparatus is not suitable for manipulating label reels of different widths, because the channel in which the label tape is guided is not accessible from outside in the region of the feed device. When the tape, independently of whether the labels are still located on the carrier tape or not, is pulled into the apparatus, care must be taken that the pins engage into the perforation openings, because otherwise a reliable tape feed is impossible in this apparatus. The diameter of the openings, however, must not be much larger than the diameter of the pins, because otherwise the tape is not fed accurately enough, since each label must be delivered upon each actuation of the manual lever in exactly the same attitude and position at the delivery point; this applies in particular, if the label is imprinted only immediately ahead of the delivery point. If then, the channel is not accessible in the region of the feed device, the tape end must be pushed into this channel. However, it is already difficult enough to insert the tape in such manner that the pins engage into the perforation, when the position of the tape end is accurately defined transversely to the direction of movement by the lateral dimensions of the channel. But if a tape must be inserted the width of which is smaller than the channel, the difficulty arises to dimension the length of the tape end inserted into the channel in such manner that a perforation opening comes into the range of a pin of the feed roller, and additionally also the further difficulty exists that the tape end must be inserted into the apparatus and into the channel from the outside without the assistance of lateral limitation in such manner that the centre line of the tape coincides with the centre plane of the feed device. This condition is fulfilled in the best case by chance, and in particular in the apparatus according to the utility model referred to above, the feed roller lies so far inside the apparatus that the tape end inserted into the channel from the outside is so long that a reasonably fast insertion of the tape end into the feed device is impossible unless the tape is guided by the lateral limitations of the channel. As mentioned above use therein of label reels the width of which is considerably smaller than the spacing of the lateral guides in the feed channel is impossible.

The U.S. patent specification 2,586,835 discloses a labelling apparatus in which the labels are not released from a carrier tape, but in which a previously printed paper tape is used from which individual tape sections are severed when a tape section corresponding to a label length is delivered by the apparatus. In this known apparatus the channel is accessible from outside in the region of the feed device in that the upper limiting wall of the feed channel can be tilted away. Nevertheless, label reels of different widths cannot be manipulated by this apparatus, because in this apparatus two pin rolls disposed on the same axis are provided as feed device and engage in perforations which are disposed in the immediate vicinity of the two tape edges.

The invention is concerned with the problem of developing an apparatus in which label reels of different widths, and therefore also labels of different widths, can be manipulated.

Starting from an apparatus according to Utility Model 1,997,251, this problem is solved in that the path of the tape is accessible from the outside of the apparatus in the region in which the feed device engages the tape.

The particular advantage of the invention resides in that label webs or tapes of different widths can be manipulated by the labelling apparatus according to the invention. Since it is accessible from outside in the region of the feed device, the label web or tape can be easily inserted into the feed device in such manner that the centre line of the web or tape coincides with the centre plane of the feed device and therefore the web or tape is engaged by the feed device in the correct position. The feed device may consist of a feed wheel which engages, by means of radial projections located in its centre plane, into a corresponding perforation the centre line of the carrier web or tape. In this case the label web or tape is preferably guided along a portion of the peripheral surface of the feed wheel, and it suffices that the label tape is accessible from outside in the region of two successive radial projections of the feed wheel. When the first two perforation openings of the leading web or tape end are engaged by the projections of the feed wheel, the resulting guidance of the web or tape will in general be sufficient for pulling the label web or tape into the centre line so that the following projections engage into the next following perforation openings.

In one embodiment of the invention a drive belt guided over the two rolls serves as feed device and is provided with outwardly projecting spikes or pins for engagement into the perforation openings of the label web or tape. In this case it is unnecessary to guide the label web or tape around a portion of the peripheral surface of a spiked wheel or the like. The web or tape may be guided in this case in a straight line along a run of the drive belt which extends parallel to the outside of the apparatus. In this embodiment of the invention, the insertion of the label tape is therefore particularly simple.

The feed device of another embodiment of the invention may be provided with two rollers engaging the label web or tape at least in the centre thereof. The periphery of the rollers is covered with a material having a high coefficient of friction. In this case also, the construction of the apparatus is such that the nip between the two rollers of the feed device is easily accessible from the outside, so that the leading end of the label web or tape can be easily inserted into the nip between the two feed rollers.

In general the label tape consists of a carrier tape on which self-adhesive labels are disposed. This label tape is guided in the apparatus around an edge or a shaft of small diameter so that the self-adhesive labels are released at this point from the carrier tape because of their stiffness. In this case the feed device will usually be disposed beyond the point at which the labels are released from the carrier tape. However, embodiments of the apparatus according to the invention are feasible in which the label web or tape does not consist of individual labels disposed on a carrier tape, but the web itself consists of the label material and individual sections are severed from this tape in the apparatus and thereafter form the labels. In this case the feed device is necessarily disposed ahead of the point at which the labels are delivered by the apparatus. If, in this case, the feed device is used which engages into perforation openings in the label web, such openings must be provided in the labels themselves. If a carrier tape is used on which releasable labels are disposed, the feed device is usually disposed beyond the point at which the labels are released from the tape. In this case, the openings for the engagement of the projections of the feed device must be provided only in the carrier tape, and the labels, which do not have perforation openings in this case, may be disposed on the carrier tape one behind the other without spacing.

It is preferable to guide the label tape in the centre plane of an apparatus casing having parallel side walls. In an embodiment of the invention the label reel is, therefore, mounted in the apparatus casing to yield resiliently in the axial direction, spring elements centering the label reel automatically in the centre plane of the apparatus. This mounting may comprise two curved spring elements which engage in axial recesses of the label reel, or two hemispherical members which are pressed by springs into axial recesses in the reel.

In embodiments in which self-adhesive labels are releasably disposed on a carrier tape and are lifted off the carrier tape at the delivery point by deflection of the carrier tape, it is not only necessary that the feed device feeds the tape always by the same length of tape section, but it is also preferable that the length of tape section between the delivery point and the feed device is adjustable within certain limits, provided the feed device engages in perforation openings in the label tape. Namely, the spacings of the leading edges of the labels relatively to the perforation openings may vary slightly from label reel to label reel. Since, however, each label must always be located in an exactly defined position after the termination of the feed step, it is preferable that, as mentioned above, the length of the tape section between the delivery point and the feed device is adjustable. This is attained in known apparatus by means of a guide pin the position of which is adjustable and which deflects the carrier tape more or less. In these embodiments, the tape is also accessible from outside in the region of this guide pin, so that when the tape is inserted the latter can be easily placed around the guide pin the position of which is adjustable.

Owing to the invention, label webs or tapes of any desirable width can be used, the web or tape width being limited only by the width of the space in which the label reel is housed in the apparatus and by the width of the feed path in the apparatus.

In one embodiment of the invention the feed device may be accessible owing to the fact that the feed device is disposed adjacent to the lower edge of the apparatus and that openings are provided at the underside of the apparatus casing in the region of the feed device. Alternatively, the whole underside of the apparatus casing may be open. In this case, the apparatus casing consists of two parallel lateral plates, wherein the forward front end is closed and the upper front end is also closed except for an opening through which the label reel is introduced into the apparatus. The rearward side is substantially closed by the hand lever, whereas the whole underside is open so that the interior of the apparatus is has the advantage that the label web or tape is accessible not only in the region of the feed device, but also that the path section between the label reels and the delivery point, and the whole path section between the delivery point and the feed device are accessible when the label web or tape is inserted. In this embodiment of the invention the label tape can be inserted into the apparatus in a particularly simple manner without the need for removing any casing parts of the apparatus.

The openings in the apparatus casing may be closable by means of slider members or the like.

In known hand labelling appliances, the label tape is advance by a certain length by each pivotal displacement of the actuating lever, in order that another label appears at the delivery point. The feed of the label tape is effected by rotation of the feed wheel which drives the perforated tape in that the pins or spikes engage into the perforation openings and thereby advance the tape. The pivotal displacement of the actuating lever is usually effected in an abrupt manner so that relatively high rotary speeds result for the feed wheel and, more particularly, very high initial accelerations are produced. Accordingly, the tape must also be highly accelerated at each displacement of the actuating lever and must be conveyed at a high speed, so that the forces transmitted by the pins or spikes of the feed wheel to the edges of the perforation openings are extraordinarily high, whereby the perforation openings are often torn. The consequence thereof are feed disturbances which can lead to a defective delivery position of the labels at the delivery point and, if the labels are to be imprinted, to an inaccurate position of the printed matter, and in many cases even to a complete derangement of the apparatus which make it necessary to pull out the tape and re-insert it by hand.

This disadvantage is avoided in that in embodiments of the invention, an arm pivotally mounted on the same axis as the feed wheel is coupled to the actuating lever and carries angle members which come into engagement with the pins of the feed wheel in the feed direction and therefore place themselves simultaneously tightly against the periphery of the feed wheel. This feature may be realised in a hand held labelling apparatus independently of the features referred to above.

The forward movement of the feed wheel by means of such a pawl has the advantage that on the one hand the feed wheel is rotated through always exactly constant angular amounts because of the engagement of the pawl with the pins of the feed wheel. Furthermore, however, the leading edge of the pawl is pressed tightly against the periphery of the feed wheel by an appropriate adjustment of the pawl, so that the label web or tape is clamped tightly against the edge of the pawl and the feed wheel. Consequently the driving forces are transmitted to the whole width of the web or tape and the openings of the feed wheel cannot be torn thereby. In this way, all the operative disturbances are avoided which occurred in the previously known hand held labelling appliances owing to inappropriate feed of the label tape.

In order that the pawl cannot damage the tape when the arm with the pawl returns into its starting position after a feed step, the pawl in a further embodiment of

the invention may be loaded by a spring which tends to hold the pawl in its rest position in which the leading edge of the pawl does not touch the periphery of the feed wheel. Although during the return movement of the arm and the pawl into the starting position no forces are exerted either upon the feed wheel or upon the label web or tape travelling over the wheel, it is preferable to provide a detent plate which co-operates with the pins of the feed wheel and which prevents rotation of the feed wheel opposite to the feed direction. In this manner the label web or tape can always be held under a certain tension.

In the previously known labelling appliances the feed of the label tape is effected always only on a part of the movement of the actuating lever, that is to say usually during the return of this lever into its starting position. Therefore, the time available for the feed of the tape is very short. This time can be lengthened and thereby the strain on the label web or tape during the feed can be reduced further, when the forward and return movements of the actuating lever are utilised for the feed of the web or tape. For this purpose, a preferred embodiment of the invention provides that the delivery point is located at the forward end of a rocker member which extends in the longitudinal direction of the apparatus from the forward end of the actuating lever to the forward end of the apparatus and is in driving connection with the actuating lever. The rocker member is also displaced during the pivotal displacement of the actuating lever and thereby the spacing between the delivery point and the feed wheel is increased, so that the tape is pulled forward a short distance beyond the delivery point by the displacement of the rocker member. During the return of the actuating lever into its starting position, the rocker member returns also into its starting position, whereby the spacing between the delivery point and the feed wheel is reduced, whereas simultaneously the feed wheel is rotated for pulling forward the label web or tape. Consequenttly, the label web or tape is pulled beyond the delivery point at a lower speed than it is pulled forward by the feed wheel whereby a significant reduction of the strain on the web or tape is obtained.

In this embodiment of the invention the arm carrying the pawl may be constituted by an angle member which is provided with an attachment which is in driving connection with the rear end of the rocker member. Furthermore the rocker member may be loaded by a spring which tends to hold the rocker member in a rest position in which the forward end of the rocker member, which is provided with the delivery point, is located at the lower edge of the apparatus. In this manner, not only a very simple construction is obtained, but also the further advantage is gained that the delivery point at the forward end of the rocker member is resilient so that the stresses which are produced during the transfer of the labels to the objects to be labelled are highly reduced.

The rocker member provided according to the invention may also serve for simplifying the printing devices present in such appliances. Thus, a preferred embodiment of the invention provides that the rocker member has near its forward end a press plate around which the label tape is guided, and that above this press plate a stationary printing mechanism is disposed against which the rocker member with the press plate impinges upon actuation of the actuating member. Therefore, a stationary printing mechanism can be used in the apparatus according to the invention, whereby further important simplifications are obtained. In particular, the rocker member may also be provided with an arm which is guided past the printing mechanism and to which a cranked lever with an inking roll is pivotally connected which is guided over the press plate of the printing mechanism during the pivotal displacement of the rocker member. Thus additional driving means for inking a printing mechanism are also avoided.

In order that the inking roll comes into engagement with the printing mechanism only at the point at which the ink is to be delivered, a further embodiment of the invention provides that rollers may be disposed at both ends of the inking roll and roll on cams which are disposed on both sides of the printing mechanism and which permit the printing mechanism to be contacted by the inking roll only in the region of the printing surface.

At the forward end of the rocker member and in the extension of the press plate, a comb member consisting of a resilient material may be attached which serves for transferring the labels to the objects to be labelled. If desired, support members for the label may be disposed in the region between the press plate and the comb member.

The construction of the apparatus according to the invention makes it possible to locate the feed wheel relatively far from the rear end of the apparatus and to guide the label web or tape away from the feed wheel through a hollow hand grip of the apparatus towards the back, so that it interferes as little as possible with the handling of the apparatus during labelling.

In known hand held labelling appliances the pressing down device consists of an opaque cylindrical roll. This has the disadvantage that the forward edge of the label fed forward under the roller is covered by this pressing-down roll and is therefore invisible, so that an accurate location and attachment of the label to the support is impossible. Frequently, however, it is desirable to attach the labels at an exactly predetermined point. In a device of this kind known from the German published specification 1,155,390, the roll is produced from a rubber elastic material and its periphery is provided with shallow grooves. These grooves have the purpose that the whole roll periphery does not rest on the label, but only the ridges left between the grooves, these ridges rolling upon the labels in the gaps between the freshly imprinted markings. It is prevented thereby, that when the labels are pressed upon the support the freshly printed markings are smudged. However, also in this known arrangement the leading edge of the label is not visible from above and thus an accurate location of the label on the support is impossible.

This disadvantage is avoided in one embodiment of the invention in that the pressing-down device is transparent in the region in which the leading edge of a label located in the delivery station comes to rest, and that casing parts and other parts of the apparatus are disposed outside a line of sight which extends from the leading edge of a label located in the delivery station to the region of the underside of the apparatus at an angle which amounts to at most 105 angular degrees. This feature of the invention may be realised in a hand held labelling apparatus independently of the features referred to above.

By the configuration of the apparatus according to the invention, the forward edge of the label located under the pressing-down device is always clearly visible, so that there are no difficulties, even for an untrained user, to place and align the labels correctly.

In further modifications of the invention, the pressing-down device may consist of a transparent, preferably glass-clear, synthetic resin. In a preferred embodiment of the invention, however, the pressing-down device is provided with recesses which extend upwardly from the region in which the forward edge of a label comes to rest which is located in the delivery station. Thereby, the constructor is not restricted to producing the highly stressed pressing-down device from a transparent synthetic resin.

The other apparatus and casing parts are so disposed that the view from above upon the forward edge of the label is unimpeded. In this case, the invention must not be limited to a pressing-down which is disposed at the forward lower edge of the hand held apparatus and projects forwardly from the apparatus. On the contrary embodiments are also feasible in which the line of sight does not extend outside the apparatus casing, but through a viewing window provided in the casing. In this case, it is unnecessary to dispose the pressing-down device at the forward lower edge of the apparatus; it may be disposed

alternatively at the underside of the apparatus, set back slightly from the forward lower edge of the apparatus. In this case, the angular relationship statement made above must be so understood that the lower limb of the angle points from the window in the direction of the operator.

The most favourable angle of sight lies between 45° and 90°. If the pressing-down device projects from the forward end face of the apparatus, certain, though not insuperable difficulties are created by the parts located within the casing, when the forward front end must extend at an angle of less than 30°. On the other hand, a forward end face extending at an angle of 105° to the under surface of the apparatus appears to be still tolerable when the operator is to view along this forward end face upon the forward edge of the label. Obviously, it is unnecessary that the forward end face is flat; but it is important that the view upon the forward edge of the label is free and is not obstructed by any parts of the apparatus. Also the pressing-down device and thus the delivery station may be located relatively far beyond the end face of the apparatus, for example by means of lug shaped projections in the side walls of the casing or by means of extensions of these casing side walls which are constructed as carriers, the pressing-down device then being attached to the forward end, and this region being covered upwardly by a cover plate.

Also in the case when the pressing-down device and thus the delivery station is disposed at the underside of the apparatus, set back relatively to the forward edge, and the forward edge of the label located in the delivery station is visible through a viewing window extending through the apparatus, this window and thus the field of view and the magnitude thereof may be disposed in various different ways.

In an embodiment of the invention a roll is provided as pressing-down device which consists of circular discs disposed at a mutual spacing. The circular discs are mounted on a common shaft with the intervention of spacer members of small diameters. In this case, the spacing between the individual discs may preferably be greater than the thickness of a disc.

The parts of the pressing-down device lying upon the label may consist of a hard material. In one embodiment of the invention, these parts, however, consist of a resiliently yielding material, for example natural rubber, rubber-like synthetic resins or other materials having spring-like properties may be utilised. Thereby, the labels can be pressed down evenly if the support is uneven. Moreover, the resilience of the pressing-down device reduces the shock which the apparatus receives when it is placed hard upon an object to be labelled. Also, a reduction of this shock is obtained when the pressing-down device itself consists of a hard material, but is resiliently attached to the casing of the apparatus.

In a particularly preferred embodiment of the invention, a comb member with finger-like teeth or prongs is provided as pressing-down device. The use of a comb member compared with the previously known roll has firstly the advantage that the bearing for the roll can be omitted. Moreover, the teeth or prongs of such a member can very easily be constructed in a resiliently yieldingly manner, for example when the teeth or prongs consist of a spring steel or the like. It is technically very simple to provide such a pressing-down element with spring properties which permit labels to be attached quickly and reliably on any curved articles, for example food cans or glasses with relatively small diameter, articles with relatively narrow depressions or grooves, or small tubes for example for tablets, in which case the labelling apparatus is guided in the direction of a surface line of the curved surface. This feature was not attainable, or at least not satisfactorily attainable, with the known appliances because of the relatively large shape stiffness of the roll. The construction of a pressing-down element in the form of a comb member is therefore also of advantage when the pressing-down element is not so attached that the forward edge of the label is clearly visible from above. In conjunction with the preceding features which ensure the visibility of the forward edge of the label, the comb member has the still further advantage that the label is visible even when the viewing direction is from the side, whereas in the case of a disc roll the viewing direction must not deviate far from the disc plane in order that the discs do not block the view upon the label.

The embodiment of the invention in which the pressing down device is provided which consists of a roll with circular discs disposed on the same axis at a spacing from each other may be modified further in the manner that the discs are not circular but are star shaped so that a kind of spiked roll is obtained. If the discs consist of a resilient material, such an embodiment has the advantage that the pressing-down device is extremely easy to deform and it is also possible to roll labels along a surface line of outwardly curved articles.

In an embodiment of the invention provision is made that the discs or the spikes or prongs engage the label in a gap between the individual imprinted markings. It is ensured thereby, that the imprinted markings, which may not yet be sufficiently dry because of the short interval of time between imprinting and attachment to resist rubbing, are not smudged by the discs or the spikes or prongs.

The comb member provided as pressing-down device may have different configurations. For example, it may consist of a cylinder which is provided with radially extending prongs or spikes.

In a preferred embodiment of the invention, however, the comb member consists of a cylinder with spikes or prongs which extend approximately tangentially therefrom. When a label is attached to an article the spikes or prongs are bent transversely to their longitudinal direction. In the case of spikes or prongs disposed radially of the cylinder, this bending away is less favourable than in the case of spikes or prongs extending approximately tangentially from the cylinder, whereby this embodiment is afforded increased life.

The comb member may consist for example of different materials. Thus the cylinder may consist of a relatively rigid material, for example wood, or a hardenable synthetic resin, such as a thermoplastic or thermosetting resin, into which spikes or prongs of a resilient synthetic resin are inserted. In a particularly preferred embodiment of the invention, however, the comb member is produced in one piece from a synthetic resin. Thus cylinder and spikes or prongs consist of the same material. As provided in a further embodiment of the invention, the comb member may be moulded. In this manner, a pressing-down device is obtained which can be producer very economically, and the mounting thereof can easily be constructed in such manner that the device is quickly and simply interchangeable, when desired. Thereby, the usefulness of the apparatus according to the invention is increased and the production cost is lowered.

Further details of the invention are clear from the following description of embodiments of the invention in conjunction with the claims and the drawing. The individual features may be realised in other embodiments of the invention either individually by themselves or a plurality thereof in any desired combination.

The parts which are essential for understanding the invention are illustrated diagrammatically in the accompanying drawing, in which:

FIG. 1 illustrates a longitudinal section through one embodiment of the hand held labelling apparatus according to the invention,

FIG. 2 is a plan view of label tapes of different widths,

FIG. 3 is a longitudinal section through another embodiment of the invention,

FIG. 4 illustrates on an enlarged scale a detail which is indicated by the arrow IV in FIG. 3,

FIG. 5 illustrates on an enlarged scale the pressing-down device and the label delivery point of a further embodiment of the invention, and

FIG. 6 is a plan view of the pressing-down device and the label tape at the delivery point corresponding to FIG. 5.

In the embodiment of the invention illustrated in FIGS. 1 and 2 an actuating lever 3 is pivotally attached to a pin 2 at the rear end of a hollow hand grip 1. The forward end of the lever 3 engages into an apparatus casing 4 and is provided with an elongated opening 5 which terminates in its forward edge and which guides a pin 6 linking two rocker levers 7 of identical shape which are pivotally mounted at a spacing from each other on a pin 8. The spacing of these two levers 7 from each other is slightly greater than the widest label tape to be manipulated in the apparatus. The hand grip 1 is formed in one with a base plate 9 which constitutes a side wall of the casing in which the pin 8 is fixed. The other side wall of the apparatus casing 4 is formed by a plate 10 which is also visible in FIG. 2 and which is permanently fixed to the apparatus after assembly of the individual apparatus parts. The rearward arms 11 of the levers 7 are connected to each other by the pin 6 and additionally by a further pin 42 which is engaged by one end of a tension spring 13 the other end of which is attached to a pin 14 of the apparatus casing, the spring holding the levers 7 and the actuating lever 3 in the position illustrated in FIG. 1. The forward arms 12 of the levers 7 are connected to each other by a pin 43 on which a roller 44 is rotatably mounted. Furthermore a press plate 15 is attached to the arms 12 in the vicinity of the forward end of the levers 7, and a roller 17 is attached to a pin 16 ahead of this press plate. At the forward end each arm 12 is provided with an upward extending arm 18 which carries at its free end a bearing pin 48 forming a pivot bearing for a guide member 19 which is rotatably mounted on the outside to this bearing pin. An inking roll 20 is rotatably mounted between the free ends of the two guide members 19. A spring 21 tends to rotate the arms 19 in the anti-clockwise direction, so that the inking roll 20 rests in the illustrated position against the lower end of a printing mechanism 22.

A pawl 23 is pivotally connected to the pin 6 at the rear ends of the lever 7 and co-operates with pins 25 which are disposed with mutually parallel axes at the side wall of a drive wheel 24. At a spacing from the wheel 24 which is mounted in the apparatus casing a second wheel 26 is rotatably mounted in the apparatus casing and a conveyor belt 27 is disposed over the periphery of both wheels; the inner surface of the belt engages in an appropriate groove in the periphery of the wheels. The belt 27 carries pins 28 which are disposed in the centre plane of the apparatus; they project perpendicularly outwardly from the outer surface of the belt and engages into perforation openings 30 disposed in the centre line of a carrier tape 29. Self-adhesive labels 31 are releasably attached to the carrier tape.

A label reel 33 is rotatably mounted in the apparatus by means of inwardly resilient hemispherical members 32 attached to the plates 9 and 10, the label reel consisting of a wound up carrier tape 29 on which the labels 31 are releasably attached. The label tape is guided between the two levers 7 under the guide roller 44, around the forward end of the press plate 15, and then along the underside of the apparatus housing over a guide roller 34 the position of which is adjustable and along the lower run of the conveyor belt 27 towards the back. A roller 35 is mounted for pivotal movement about a pin 36 in the apparatus casing and is pressed against the periphery of the wheel 24 by a blade spring 37. The roller 35 is provided at its periphery with a groove in the centre plane of the apparatus, so that the travel of the pins 28 is not impeded by the roller 35. The roller 35 can be tilted away from the periphery of the wheel 24 when a label tape is to be inserted.

The apparatus casing is open at its underside; the label reel is inserted from below, whereafter the leading end of the tape can be disposed in the casing in the manner described, that is to say under the roller 44, around the press plate 15, over the roller 34 and along the conveyor belt 27, the tape being placed against the belt in such manner that the pins 28 thereof engage into the perforation openings 30 in the tape. The leading end of the tape is then guided rearwardly out of the apparatus through a longitudinal duct 38 in the hand grip 1. The roller 35 which had previously been pivoted away is then placed again against the periphery of the wheel 24. When the actuating lever 3 is depressed, the levers 7 are rotated in the clockwise direction and the spring 13 is tensioned. The pawl 23 is displaced downward thereby, its forward inclined surface 39 slides on one of the pins 25 disposed in a circle and presses the pawl 23 outwardly, against the action of a spring 40, until the pawl engages behind and is detained by the pin. In this pivotal movement the lever arms 12 rotate upward. At the same time the inking roll 20 moves away from the lower end of the printing mechanism 22 and the label disposed on the carrier tape 29 and then located on the press plate 15 is imprinted. When the lever 3 is released, the spring 13 pivots the levers 7 back again into their original position. Thereby, the wheel 20 is rotated by one feed step. The feed movement is transmitted to the carrier tape 29 by the belt 27. In this movement the carrier tape 29 is pulled around the forward end of the press plate whereby the labels 31 are released from the carrier tape 29 because of their stiffness. The label is then deposited on a support and thereafter rolled thereagainst by means of the roller 17.

The mounting by means of the hemispherical members permits label rolls of different widths to be disposed in the space provided therefor, in such manner that the centre plane of the label reels is always disposed in the centre plane of the apparatus independently of the width of the label reel. Since also the perforations 30 are disposed in the centre plane of the carrier tape and also the pins 28 are disposed on the conveyor belt 27 in the centre plane of the apparatus, label reels of different widths can be used. The largest width of a carrier tape is limited by the width of the space receiving the label reel and by the width of the path in which the tape is guided through the apparatus. Since the feed device 24, 26, 27 does not engage the tape until the tape has travelled beyond the point at which the labels 31 are released from the carrier tape 29, the labels need not be disposed on the carrier tape that they do not obstruct the perforation openings 41 which are required for further conveyance. However, in FIG. 2 a commercially conventional label tape is shown in which the perforation openings 30 extend also through the edges of the labels 31.

Additionally to the mounting being resilient in the axial direction, the hemispherical memebrs 32 have the further advantage that they exert a certain braking effect upon the label reel 33. Also differences in the diameter of the axial recess of the label reel 33 are compensated by the hemispherical members. The axially resilient mounting has also the further advantage that it exerts a stronger braking effect on a wide label reel than on a narrow label reel because of the increased spring tension. This is advantageous because a narrow label reel must not be tensioned during the delivery of a label with as great a force as a wide label since, for the same paper quality, a narrow tape has a lower tear resistance than a wide tape. The hemispherical members 32 may consist of a piece of spring sheet forming blade springs by means of which they are attached to the side walls of the casing.

The use of a conveyor belt in the form of an endless drive belt extending over two wheels has the advantage over a feed wheel with radial pins that the tape can be

engaged very easily with three or four pins **28** without the need for guiding the tape deep into the apparatus and thus threading it over guide rolls which are located fairly far inside the apparatus. The tape section which is engaged by the feed device is relatively long. In spit of this the tape remains in the immediate vicinity of the underside of the apparatus casing so that it is easy and convenient to insert.

FIG. 2 illustrates label tapes of different widths, wherein labels **31**, **31'** and **31''** of different shapes are disposed on carrier tapes **29** of different widths.

In the embodiment of the invention illustrated in FIGS. 3 and 4, the casing 4 consists substantially also of two parallel plates **9** and **10** which are disposed at a spacing from each other and which are kept apart by face plates **50** and various pins. At the end of the lever **7** adjacent to the hand grip **3**, an elongated hole **51** is provided which guides a pin **52** attached to an angle member **53**. This angle member also consists of two flat punched parts held at a spacing from each other. The angle member **53** is pivotally mounted on a pin **54** which is rigidly attached to the casing, and carries a pawl **55**. A feed wheel **56** is mounted between the two plate-like parts of the angle members **53** and is rotatable about the pin **54**. The feed wheel **56** is provided with radially projecting pins **28**. Its periphery may be provided with a coating having a high friction surface; in the embodiment illustrated by way of example, the feed wheel consists of metal and its periphery is knurled.

A spring **57** which is disposed between the pin **6** and the pin **14** holds the lever **7** in the position illustrated in FIG. 3. A label tape reel **33** is shown inserted into the apparatus; it is removably mounted in bearings (not illustrated) in the two side walls **9** and **10**.

Partition plates **58** and **59** limit the space intended for receiving the reel **33**. The reel is located nearly completely within the apparatus, the side parts being limited rectilinearily at the top. Therefore, there is no need for a special super-structure for receiving the reel **33**. The label tape also includes a carrier tape **29** on which rectangular labels **31** are releasably disposed without mutual spacing. In this embodiment the label tape **29** extends under a roller **60**, which is rotatably mounted on the pin **8**, around the forward edge of the press plate **15** and from there directly to the periphery of the feed wheel **56** the radial pins **28** of which engage into the perforation openings **30**, **31** of the carrier tape **29**.

A comb members **61** of resilient material is attached to the forward end of the lever **7** which projects downwardly out of the casing in its rest position. In the region between the press plate **15** and the comb members **61** there are disposed support members **62** for labels. The comb member **61** includes an approximately cylinder-shaped prong holder **63** which is fixed between the levers **7**, and four finger-like prongs **64** which are disposed in their rest position at an acute angle to the direction of the tape travelling towards the pressure plate **15**.

When the lever **3** is pressed downwardly, the lever **7** is rotated in the clockwise direction, as mentioned above, and the angle member **53** is also rotated in the clockwise direction. Thereby the pawl **55** slides over the next lying radial pin **28**. A resilient detent plate **65** detains the feed wheel **56** during this movement. At the same time, the inking roll **20** is pulled over the printing type and moved into a position relaterally of the printing mechanism **22**. Since the lever **7** performs a pivotal movement around the pin **8** the loop of the label tape **29** is lengthened, so that at the end of this movement, a tap length has been withdrawn from the storage reel **33** which corresponds approximately to half the feed step, without the feed wheel **56** having been rotated. In this end position a label **31** located on the press plate **15** is pressed against the printing type of the printing mechanism **22** so that the label **31** receives an imprint. When the hand grip **3** is released, the spring **57** rotates the lever **7** in the counter clockwise direction back into its starting position. Thereby the forward edge **66** of the pawl **55** comes into engagement with the adjacent radial pin **28**. A spring **67** tends to hold the pawl **55** in such manner that in the rest position it does not press against the periphery of the feed wheel **56**. However, when during this return movement the forward edge **66** of the pawl **55** comes into engagement with a pin **28**, the pawl **55** is rotated in the anti-clockwise direction, and the forward edge **66** presses the paper against the periphery of the feed roll **56** in the manner of a clamp.

Furthermore, as mentioned before, when the double lever **7** is pivoted back, the label **31** because of its stiffness is released from the tape **29** at the delivery station while the tape **29** is pulled around the press plate **15**; the label slides over the support members **62** and its upper surface previously imprinted by the printing mechanism **22** lies against the lower faces of the springs **64**. The rear end of the label **31** adheres still to the tape **29** or to the support members **62**. The forward edge **68** of the label is easily visible between the prongs **64**. The projecting forward region of the labels **31**, the adhesive surface of which is located at the underside turned away from the sprongs **64**, is then moved into the desired position on an article to be labelled, which action can be easily and accurately performed because of the visibility of the forward edge **68**, and the label is then completely withdrawn from the apparatus by moving the apparatus away towards the back, the label being pressed down by the finger shaped prongs **64** of the comb member onto the article to be labelled.

The apparatus casing **4** is constructed at its front end **69** in such manner that the forward edge **68** of the label **31'** can be seen from above past the front end and between the prongs **64** of the comb member **61**. The angle **70** (FIG. 3) which is formed by the line of slight **71** and the direction of the apparatus underside **72**, amounts to approximately **80** angular degrees in the embodiment illustrated in the drawing.

In other embodiments of the invention not illustrated, the free ends of the two guide members **19** carry between them an inking roll which consists of a porous rubber and carries at its lateral end walls rollers of a hard material. Each of the rollers runs along a cam, the two cam members being disposed on the two sides of the printing mechanism. The cams are so constructed that the inking roll delivers the ink to the printing type at a defined position. The rollers are always pressed into contact with the cam by means of a limb spring engaging the guide members.

In the embodiment illustrated in FIG. 5, which is provided for short label lengths, the carrier tape **29** extends over the press plate **15** and around a shaft **75** having a very small diameter, the carrier tape **29** thus being deflected through approximately 180°. The shaft **75** is disposed between the levers **7** and the carrier tape **29** extends from there directly to the feed wheel **56**. In this case, the comb member **61** is disposed in the immediate vicinity ahead of the forward edge of the shaft **75**.

Furthermore, the spatial association of the comb member **61** and its finger shaped prongs **64** with the feed plane of the tape **29** carrying the labels **31** is illustrated in FIG. 5 on an enlarged scale. Because of its stiffness, the label **31'** located in the delivery station is lifted off the tape **29** which has been guided around the shaft **75**, and its upper surface rests with some bias tension against the underside of the prongs **64**.

The comb member **61** is configurated in such manner that it projects sufficiently far downwardly and forwardly out of the apparatus and that the leading end of the label lies in the vicinity of the lowest point of the comb member **61** after the conveyance of the carrier tape **29**, so that when the apparatus is pressed upon a support the label edge comes to rest between the support and the

comb member **61**. In this position the trailing edge of the label **31'** is still located on the carrier tape **29**.

In the plan view illustrated in FIG. 6 perforation openings **41** provided in the tape **29** are visible into which the pins **28** of the feed wheel **56** engage for the feed movement.

It is understood that the invention is not limited to the embodiments illustrated by way of example, but that modifications thereof are possible without leaving the scope of the invention. In particular individual inventive features may be realised by themselves, or a plurality thereof in combination, in various embodiments of the invention. For example, self-adhesive labels, gummed labels or labels without adhesive layer may be used, the latter being intended to be deposited on a support provided with an adhesive layer. In some cases, a wetting device, for example a foam rubber roll, may be provided in the region of the delivery point in order to moisten the gummed underside of the labels and thus to prepare them for adhesion.

What I claim is:

1. A hand held manually operable labelling device for the transfer of self-sticking labels from a perforated carrier strip detachably carrying the labels to a surface to be labelled; said device comprising: delivery means including a delivery point at which the labels are delivered for application to the surface, a deflecting edge adjacent the delivery point for separating the labels from the carrier strip by deflecting the carrier strip through a sharp angle, conveying means including a conveyor roller having radially extending pins for engaging the perforations in the carrier strip, said conveyor roller being disposed after the deflecting edge in the travelling direction of the carrier strip, a manually operated operating lever operatively connected for rotating said conveyor roller about its axis in a stepwise manner to advance the carrier strip a predetermined amount, a clamping arm coupled to the operating lever and mounted for pivotal movement about the conveyor roller axis, a clamping pawl pivotally mounted in the clamping arm for selectively engaging the conveyor roller surface and the radially extending pins during the advancement of the carrier strip, whereby this clamping pawl operatively clamps the carrier strip against the conveyor roller surface to assist the radially extending pins in applying advancing forces to the carrier strip.

2. A device according to claim **1**, further comprising a resilient member connected to said clamping arm and said clamping pawl for normally biasing said clamping pawl into engagement with the conveyor roller surface.

3. A device according to claim **1**, further comprising a detent member operably engageable with said radially extending pins for preventing rotation of the conveyor roller in the direction opposite the advancing direction.

4. A device according to claim **1**, wherein the clamping arm is formed by an angle member having a projection in driving connection with a rearward portion of the operating lever.

5. A device according to claim **1**, wherein the connector between the operating lever and the clamping arm includes a pin in the clamping arm and a slot in the operating lever.

6. A hand held manually operable labelling device for the transfer of self-sticking labels from a carrier strip detachably carrying the labels to a surface to be labelled; said device comprising a casing, delivery means including a delivery point at which the labels are delivered for application to the surface, a deflecting edge adjacent the delivery point for separating the labels from the carrier strip by deflecting the carrier strip through a sharp angle, conveying means including a manually operated operating lever for moving the carrier strip stepwise respectively one label length for each labelling process, said lever being pivotal about a lever pin fixed in said housing between the deflecting edge which is formed at a forward end of the lever and a force accepting portion at the rearward end of the lever, said conveying means further including rotatable conveyor means having a conveyor axis of rotation parallel to and fixedly positions with respect to the lever pin in a direction opposite the deflecting edge, said rotatable conveyor means including engaging means for engaging said carrier strip, a supply means for supplying a combination carrier and label strip to said deflection edge, guide means for guiding said carrier strip and associated labels through the device, said guide means including a guide roller mounted on said lever and positioned between said supply means and said deflecting edge, said guide roller being rotatable about the axis of the lever pin, the carrier strip being positioned in said device for passing from said supply means and then in engagement with said guide roller and then around said deflecting edge where the labels are separated therefrom and then into engagement with the rotatable conveyor means, said lever being operable to advance the carrier strip off of said supply means a predetermined first part of a label length upon initial manual rotation of said lever in the clockwise direction by the relative movement of the deflecting edge and the supply means and the fixed anchoring of the carrier strip on the engaging means of the rotatable conveyor means, and spring means for rotating said rotatable conveyor means by pivoting the lever in a counter-clockwise direction after the initial manual rotation, the rotation of said rotatable conveyor means being operable to advance the strip a label length, said label length including the first part of a label length initially drawn off of the supply means, whereby a rapid operation of the device is possible because of the reduction in tension forces on said strip due to the two step removal from the supply means.

7. A device according to claim **6**, wherein the engaging means on the rotatable conveyor means are radially extending pins which engage in perforations provided in the carrier strip.

8. Apparatus as claimed in claim **6**, wherein the lever member is loaded by a spring which tends to hold the lever member in a rest position in which the forward end of the lever member, which is provided with the delivery point, is located at the lower edge of the apparatus.

9. A device according to claim **6**, wherein the rotatable conveyor means is a wheel and the engaging means are radially extending pins, and wherein the carrier strip includes perforations for acceptance of said pins.

10. A device according to claim **9**, wherein said perforations are along the centerline of said carrier strip.

11. A hand held manually operable labelling device for the transfer of self-sticking labels from a carrier strip detachably carrying the labels to a surface to be labelled; said device comprising: a casing, delivery means including a delivery point at which the labels are delivered for application to the surface, a deflecting edge adjacent the delivery point for separating the labels from the carrier strip by deflecting the carrier strip through a sharp angle, conveying means including a manually operated operating lever for moving the carrier strip stepwise respectively one label length for each labelling process, said lever having a pivot axis disposed between the delivery point disposed at its forward end and a force accepting portion at its rearward end, the lever being disposed with respect to the casing such that the delivery point can be selectively pivoted into the interior of the device, whereby the device is protected against damage by the casing when it is placed too vigorously on the surface to be labelled during the labelling operation.

12. A device according to claim **11**, wherein the lever is locked by a spring for holding the lever in a rest position with the forward end including the delivery point located slightly below a lower edge of the casing, said forward end of the levers being movable into the inside of the device upon the application of a predetermined force to the delivery point.

13. Apparatus as claimed in claim **11** wherein the lever member is provided near its forward end with a press plate around which the label tape is guided, and wherein a stationary printing mechanism is disposed above the pressure plate, the press plate of the lever member being arranged to impinge on the printing mechanism when the actuating lever is pivoted.

14. Apparatus as claimed in claim **13**, wherein the lever member is provided with an arm which is guided past the printing mechanism, and wherein a cranked lever supporting an inking roll is pivotally connected to this arm, the inking roll being guided over the printing surface of the printing mechanism when the lever member is pivotally displaced.

15. Apparatus as claimed in claim **14**, wherein rollers are disposed at both end of the inking roll and are arranged to roll on cams disposed at both sides of the printing mechanism, the said cams permitting contact of the printing mechanism with the inking roll only in the region of the printing surface.

16. Apparatus as claimed in claim **13** wherein a device for pressing the label against a support is attached

to the forward end of the lever member in a extension of the press plate.

17. Apparatus as claimed in claim **16**, wherein support members for labels are disposed in the region between the press plate and the pressing device.

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